

# ANTECEDENTS OF MASS CUSTOMIZATION AND CUSTOMER SATISFACTION IN SUDAN

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**ABSTRACT-** As markets grow and become increasingly competitive, customization is being recognized as an important tool to satisfy and retain customers; this study investigates the relationship between antecedents of mass customization and customer satisfaction in Sudan; the main objective of the study was to examine whether Antecedents of Mass Customization lead to customer satisfaction.

The target population for the study was the customers that have been already purchased mass customized products and because the topic is new and not having great base here in Sudan; we've chosen the painting industry as it is offering customized paints and has many customers; this study used questionnaire as tool of data collection, total questionnaires distributed was 270.

The data was collected in January-April 2014 and was analyzed using SPSS version 17.0; The findings indicated that Perceived usefulness ( $\beta = .364, p = .003$ ), Self-confidence ( $\beta = .235, P = .009$ ), Product aesthetics ( $\beta = .357, P = .020$ ) had statistically significant and positive effect on customer satisfaction while Attitude ( $\beta = -.188, p = .524$ ) had effect on customer satisfaction.

The present study also holds implications for marketing practitioners interested in pursuing a mass customization strategy.

**Keywords:** customer satisfaction, Attitude, Product aesthetics, Perceived usefulness, Self-confidence, Sudan

## 1. INTRODUCTION

Nowadays mass customization is one of the most searched concepts in the production and marketing field. According to Xuehong Du *et al* (2003), in 1995 only, the result of internet search the term "mass customization" was 350 but these days, more than 70,000 hit is encountered the search of mass customization through internet. According to literature, more than 2300 articles published about mass customization since the term was formally coined 1993, about 60% of them was written in 2001 and 2002 (Xuehong Du *et al* 2003). Therefore, this indicated how it's important to address this concept.

Moreover, in this era of competition and economic crises, firms facing difficulty to succeed without pleasing their customers. In this case, many firms shifted from the traditionally way of mass production into mass customization. Many studies had been conducted how customers perceive mass customization and whether it increases their satisfaction. Therefore, it's important to identify how mass customization related to customer satisfaction by looking at painting industry in Sudan.

## 2. LITERATURE REVIEW

### A. Mass customization

Traditionally, firms were using mass production form to implement their production. Mass production and mass customization are two operational formats organizations use to satisfy customer preference based-demand (Kai Jinan & Haul 2006). The shift of customer behavior and advanced technology forced to adopt new philosophy of production- mass customization.

According to Davis, he proposed in his book for *Future Perfect*, a competitive advantage would increase companies who produce mass production on customized basis. According to him, mass customization provides individual consumers with a product that matched to their specific needs and wants while these customized products are produced in a mass production, allowing them to be sold prices that reflect economic of scale. Kai Jinan and Haul (2006) mentioned in their study, mass customization can be classified into two: initial build-to-stock phase and final customize-to-order phase.

Father more, Gilmore and Pine (1997) suggested that four different approaches for customization: collaborative customization, adoptive customization, cosmetic customization, and transparent customization. Collaborative customization: company communicates to the individual customers to express their individual needs and wants, then, the company establishes the product based on their needs and wants. Adoptive customizers: designs the product that consumers adjust themselves. On the other hand, cosmetic customizers use one standard product but the way they represent consumers is different from one another. Finally, transparent customizers closely monitor

individual consumer usage and provide unique goods or service without letting know the consumer explicitly that they are receiving customized goods

Mass customization is mostly related to service industries for financial sectors and insurance (Victor and Boynton, 1998). Customization is becoming important in many countries. For example US companies are increasingly adopting mass customization and of the biggest successes of US companies is their closeness to the individual customer and their ability to cater to the customer's individual needs (Sheffi, 2004).

### B. Customer Satisfaction

Customer satisfaction is one of the most talked phenomena and it has been viewed from different prospective. Traditionally customer satisfaction had been defined the interaction between customer pre-purchase expectation and post-purchase evaluation (Cadotte *et.al.*, 1987). Anton (1996) also defined customer satisfaction as a state of mind after met or exceeded the consumer's needs, wants or expectation, resulting future purchase and loyalty.

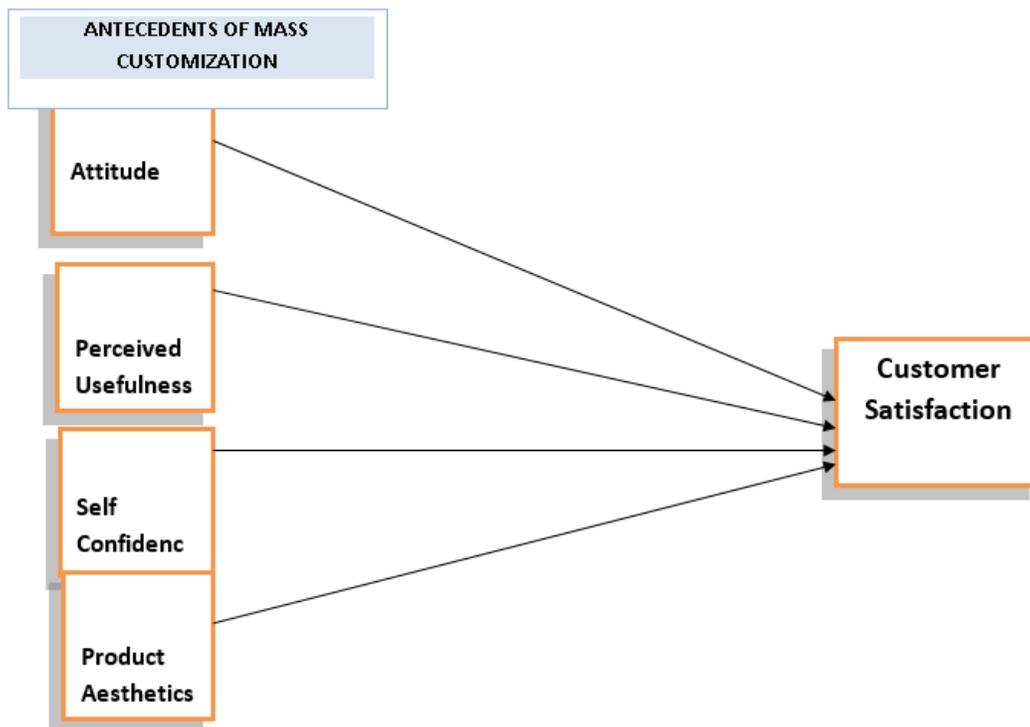
In the sense of satisfying customer needs, quality is one of the factors differentiates among the products (Norman, 1998). According to (Moffat S, 1990), it becomes more acceptable that customers are willing to pay more for products that are fit their individual size, need, test, preference, style or expressions. By looking at flexibility of manufacturing system and the high speed of information exchange, Mass customization may satisfy customer needs. According to Jiao J and Tseng MM (2004), mass customization enables high profit margin for designers and manufacturers, better and improved customer satisfaction as well as value added business opportunity.

On the other hand, explosion of product variety leads to high cost of in design, production, inventory and logistic (Da Silveira *et al* 2001). In addition, implement wide variety of products available and letting customer to vote on shelf seems not only to be wasteful, but also tends to constrain customer satisfaction. Therefore, to meet customer needs in cost efficiency way, mass customization has become important approach (Spring M *et al* 2000). Also, mass customization provides better service to customers by improving the order-fill rate, the quality, and the varieties of products, while still maintaining low operating costs with regard to production, inventory, and logistics (Tu *et al.*, 2004). Mass customization canbe achieved through postponement (Feitzinger and Lee, 1997) and modularity (Tu *et al.*, 2001) in product design and process management.

### 3. CONCEPTUAL FRAMEWORK AND RESEARCH HYPOTHESIS

Based on the literature review, the integrative framework of this study is anchored on the Relationship between the antecedents of the customized products and the customer satisfaction. The influence of the factors chosen on the mass customization is justified on the bases of the Planned Behavior theory and other previous studies.

The framework demonstrates the influence of the attitude, perceived usefulness, self- confidence, and product aesthetics variables on customer satisfaction



### C. Research hypothesis

H1: Attitude has positive influence on the customer satisfaction

H2: Perceived usefulness has positive influence on the customer satisfaction

H3: Self- confidence has positive influence on the customer satisfaction

H4: Products aesthetics has positive influence on customer satisfaction

#### 4. FINDINGS AND DISCUSSION

##### A. Demographic profile

According to below table 1, gender, the frequency of male were 28 with percentage of 18.4% while female frequency were 124 with percentage 81.6%. This result shows that women are more involved in the products customization. Marital status, the frequency of the single were 119 with percentage of 78.3%, married frequency were 22 with percentage of 14.5%, This result showed that the majority of interested respondents in product customization are single due to their little responsibilities and high interest in customizing their own products. Conversely, the widows and the divorcees just are losing interest in such type of customization. They don't venture as single respondents do, while number of divorced respondents were 9 with percentage of 5.9%. Widows were 2 with percentage 1.3%

In terms income as appeared in the below table, the most and clustered area of the whole respondents were in the level average income which shows that the number of respondents with average income were 110 which results 72.4%, the second respondents with high level of income were 9 which results 5.9%. This indicates the customizing products cannot be done or even interesting with the low income. And this is supported in the profession where employed respondents were 100 representing 65.8% from the total sample. Students were 37 which results 24.3% while entrepreneurs were 3 which results 2%, and unemployed were 12 which results 7.9%. And the last category, as mentioned by them, they depend on their parents financially.

Table 1: Demographic Profile	Frequency	Percent
<b>Sex</b>		
Male	28	18.4
Female	124	81.6
Total	152	100.0
<b>Marital status</b>		
Single	119	78.3
Married	22	14.5
Widow	2	1.3
Divorced	9	5.9
Total	152	100.0
<b>Income</b>		
Low (Less than 500 SDG)	33	21.7
Average (1000 SDG)	110	72.4
High (Above 1000 SDG)	9	5.9
Total	152	100.0
<b>Profession</b>		
Student	37	24.3
Employee	100	65.8
Entrepreneur	3	2
Unemployed	12	7.9
Total	100	100.0

##### B. Reliability test

A reliability test was conducted to assess the internal consist of the items by using Cronbach's alpha. A variable is reliable and internally consistent when the alpha is .70 and above (Hair, Black, Babin, & Anderson, 2010). However, Bowling (2009) suggests that alpha of .50 and above is an indication of internal consistency. Based on the literature, all the Cronbach's alpha scores for the variables were greater than .60. The highest alpha was obtained by product aesthetics ( $\alpha=.964$ ), attitude ( $\alpha=.898$ ), while self- confidence and perceived usefulness were sharing the same alpha ( $\alpha=.893$ ) and customer satisfaction ( $\alpha=.957$ ).

Table 2: Reliability Test of all variables

Variable	No. of Items	Cronbach's Alpha
Product Aesthetics	7	.964
Attitude	5	.898
Self Confidence	5	.893
Perceived Usefulness	5	.893
Customer satisfaction	4	.957

### C. Correlation analysis

The below table shows the correlation between the variables DV with IV, .Product aesthetics has showed correlation with attitude( $r=-.526, p=.000$ ), with self- confidence ( $r=-.573, p=.000$ ), with perceived usefulness( $r=-.553, p=.000$ ), with customer satisfaction ( $r=-.530, p=.000$ ).

While attitude also showed correlation with other variables; self- confidence ( $r=.653, p=.000$ ), perceived usefulness ( $r=.777, p=.000$ ), customer satisfaction ( $r=.569, p=.000$ ). Also, self- confidence showed correlation with other variables; perceived usefulness ( $r=.731, p=.000$ ), customer satisfaction ( $r=.623, p=.000$ ), Perceived usefulness showed correlation with customer satisfaction ( $r=.625, p=.000$ ).

**Table 3. Pearson's correlation of variables**

No.	Variables	1	2	3	4	5
1	Product Aesthetics	1				
2	Attitude	-.526**	1			
3	Self Confidence	-.573**	.653**	1		
4	Perceived Usefulness	-.553**	.777**	.731**	1	
5	Customer Satisfaction	-.530**	.569**	.623**	.652**	1

### D. Predictors of mass customization and Customer Satisfaction

This section thought to investigate the effect of antecedents of mass customization namely; attitude, perceived usefulness, self- confidence, and product aesthetics the customer intention to co- design the customized products. Four hypotheses were developed based on the literature.

Regression analysis was used to test the relation between attitude and customer satisfaction H1. The regression analysis result in Table 4 indicates that attitude has no significant influence on customer satisfaction ( $\text{Sign}=.524$ ), therefore, H1 rejected. Also, the below table shows that H2. Perceived usefulness has significant influence on customer satisfaction ( $\text{Sign}=.003$ ). So, H2 is accepted. Regarding H3 self- confidence has positive effect on customer satisfaction; the results show that self- confidence has significant influence on co- design ( $\text{Sign}=.009$ ). Therefore, H3 is accepted. H4 product aesthetics has positive influence on customer satisfaction; results show that product aesthetics has no significant influence on customer satisfaction ( $\text{Sign}=.020$ ). So, H4 is rejected. ).

**Table 4: Regression of Predictors with Customer Satisfaction**

Predictors	Customer Satisfaction
Attitude	-.188
Perceived usefulness	.064**
Self- confidence	.235**
Product aesthetics	.357*
R2	.493
Adjusted R2	.479
R2 Change	.493
F Change	35.430***

$P > .000 = ***$ ,  $P > .001 = **$ ,  $P > .01 = *$

## 5. DISCUSSION

The research model was constructed based on the model of TPB (Theory of Planned Behavior) which is widely applied in academics. The TPB was used to explain the major determinants of consumer acceptance of mass customization with customer satisfaction.

The first objective of this study was to investigate the influence of the predictors of mass customization with the customer satisfaction. Because mass customization is still new to the respondents, they might have had relatively little knowledge of and no clear expectations about mass customization. After they tried the process, they might have become less uncertain and more positive about mass customization. This finding is consistent with innovation and diffusion theory (Rogers, 2003), in which trial ability is one way of increasing adoption of an innovation and results in less uncertainty about the innovation.

On the other hand perceived usefulness and self- confidence showed positive relation with customer satisfaction. While product aesthetics showed no positive relation with customer satisfaction.(Schreier, 2006; Merle et al., 2010), focused on the benefits consumers perceive during the MC experience, and on how this value influences satisfaction with the experience. That's why this study has included the co- design as a main variable influencing the customer satisfaction.

#### REFERENCE

- [1] Anton, J. (1996), *Customer Relationship Management*, New Jersey: Prentice-Hall Inc
- [2] Bowling, A. (2009). *Research methods in health: Investigative Health and Health Services* (3rd ed.). New York: McGraw-Hill. 162—176.
- [3] Cadotte, E. R., Woodruff, R. B., & Jenkins, R. L. (1987). Expectations and norms in models of consumer satisfaction. *Journal of Marketing Research*, 24, 305–314
- [4] Da Silveira G, Borenstein D, Fogliatto FS (2001) Mass customization: literature review and research directions. *Int J Prod Econ* 72(1):1–13
- [5] Davis, S.M (1987, *Future Perfect*, Adisson-Wesley, Reading, MA, p. 157
- [6] Feitzinger, E. and Lee, H.L. (1997), “Mass customization at Hewlett-Packard: the power of postponement”, *Harvard Business Review*, Vol. 75 No. 1, pp. 116-21.
- [7] Gilmore, J.H and Pine, B.J II (1997), “The four faces mass customization”, *Harvard Business Review*, Vo.1, pp. 32-49
- [8] Hair, J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed). Upper saddle River, New Jersey: Pearson Education International.
- [9] Jiao J, Tseng MM (2004) Customizability analysis in design for mass customization. *Comput Aided Design* 36(8):745–757
- [10] K. J., LEE, H. L., & R. W. (2006). Satisfying customer preferences via mass customization. *IIE Transactions*, 38, 25-38.
- [11] Moffat S (1990) Japan's new personalized production. *Fortune* 122(10):132–135
- [12] Norman DA (1998) The invisible computer: why good products can fail, the personal computer is so complex, and information appliances are the solution. MIT Press, Cambridge, Massachusetts
- [13] Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- [14] Schreier, M. (2006). The value increment of mass-customized products: an empirical assessment. *Journal of Consumer Behaviour*, 5 (4), 317–327.
- [15] Sheffi, Y. (2004) *Postponement for U.S. manufacturing*. Research report, Cambridge, UK. MIT Center for Transportation and Logistics.
- [16] Spring M, Dalrymple JF (2000) Product customization and manufacturing strategy. *Int J Oper Prod Manage* 20(4):441–467
- [17] Tu, Q., Vonderembse, M.A., Ragu-Nathan, T.S. and Ragu-Nathan, B. (2004), “Measuring modularity-based manufacturing practices and their impact on mass customization capability: a customer-driven perspective”, *Decision Sciences*, Vol. 35 No. 2, pp. 147-68.
- [18] Victor, B. and Boynton, A. (1998) *Invented here: Maximizing Your Organization's Internal Growth and Profitability*, Harvard Business School Press, Boston, MA
- [19] X. D., J. J., & M. M. (2003). Identifying Customer need patterns for Customization and Personalization. *Intergrate Manufacturing System*, 14 (5), 387-396.